5. IMPACTS OF COMMERCIAL OPERATION

Following the completion of the 24-month demonstration in March 2004, three scenarios are reasonably foreseeable: (1) a successful demonstration followed immediately by commercial operation of the facility at approximately the same power level using the CFB combustor and other equipment from the demonstration; (2) an unsuccessful demonstration followed by limited commercial operation of the facility to the extent possible, with the balance of JEA's projected demand being met by purchasing electricity from other utilities; and (3) an unsuccessful demonstration followed by conversion of the facility to a conventional coal- and petroleum coke-fired power plant using best available control technology, including low-NO_x burners and a wet flue gas desulfurization system. A wet flue gas desulfurization system would be necessary to achieve a 98% SO_2 removal rate, comparable to that expected from the combination of the CFB combustor and the polishing scrubber for the proposed project. Under all three scenarios, the expected operating life of the facility would be 30 years.

Under the first scenario, the level of short-term impacts during commercial operation would not change from those described for the demonstration in Section 4 because the proposed facility would continue as a baseload power plant operating 24 hours per day with the same operating characteristics. For long-term effects, the level of impacts would be nearly identical to those discussed in Section 4, except for impacts that accumulate with time (i.e., ash disposal). As described in Section 4.1.7, the preferred alternative for management of the combustion ash would be to sell it as a by-product to offsite customers. An aggressive marketing program would be implemented to maximize the quantity sold. If more than approximately 70% of the ash could be sold over the 30-year lifetime of Northside Generating Station, the 40-acre storage site (cells I and II combined) described in Section 4.1.7 would be sufficient for complete containment, and disposal of the material would not be an issue. However, additional truck traffic would be associated with transporting the ash from Northside Generating Station to the offsite customers. Additional permanent disposal space would be required if JEA could not sell over 70% of the ash. In the unlikely event that none could be sold, an additional 80 to 100 acres of disposal space would be required over the 30-year operating life of the facility.

The 40-acre combustion ash storage area would have the following appearance when filled to its capacity of 4.2 million tons. The 10-acre central core would be nearly flat on top and reach a height of 100 ft. Approximately 2.1 million tons of ash would be contained in the central core when filled to capacity. A 30-acre perimeter containing the remaining 2.1 million tons of ash would slope away from the central core at an 18° angle (1:3 vertical to horizontal).

The time required for the storage area to reach its capacity of 4.2 million tons would depend on several factors: (1) the percentages of coal and petroleum coke used in the combustion process, (2) their actual ash and sulfur contents, (3) the amount of lime and limestone required in the combustion process, and (4) the quantity of ash that could be sold before the site reaches its capacity.

The time required to reach capacity can be bounded by assuming that either typical coal or petroleum coke would be burned 100% of the time. The annual two-unit total for generation of combustion ash would be 326,000 tons for coal or 560,000 tons for petroleum coke (Table 2.1.1). Assuming that none of the ash would be sold, the storage area would reach its capacity of 4.2 million tons in 13 years for coal ash or 7.5 years for petroleum coke ash. Although the actual percentages of coal and petroleum coke to be burned cannot be predicted over the long-term, a 10% variation on either side of an even mix would not be unreasonable. Thus, the 40-acre storage site would likely be filled to capacity following 9 to 11 years of facility operation.

The length of time to reach capacity would increase as the rate of sale of ash increases. If the rate of sale eventually exceeds the rate of production, the storage capacity may be reached before falling below capacity or, alternatively, the capacity may never be reached (depending on the timing of successful marketing).

Slope failures would be unlikely because the hydrated ash is similar to other cementitious materials in composition with negligible loose material to erode. If erosion from torrential rain should occur along the 18° angle side slopes of the pile, corrective action to prevent further erosion could include removal of part of the pile to decrease the steepness of the slope, which would reduce the amount of ash that could be stored on the site, and/or emplacement of riprap at locations that are vulnerable to erosion.

If additional disposal space were required in the future, the property directly north of the Northside property could be an option. JEA would need to purchase the property and receive a disposal permit. Another alternative would be to use additional landfill capacity available at the St. Johns River Power Park. Because the Power Park is a joint venture, JEA and Florida Power & Light are discussing the use of the Power Park for disposal of the ash. In addition to the economic advantage of using the above properties, little or no additional offsite truck traffic would result. As another option, JEA could acquire other land that would be dedicated to disposing of the material.

As a last resort, existing offsite landfills could be used to dispose of the ash. Four large landfill sites that are permitted to dispose of nonhazardous industrial waste have been identified in northeastern Florida and southeastern Georgia. Ash from the CFB combustor at Northside Generating Station would require EPA-approved certification that it is nonhazardous before it would be accepted for disposal.

The two nearest offsite landfills are an unnamed site in Nassau County, Florida, and the Trail Ridge site near Baldwin, Florida (approximately 20 miles north and 25 miles west of Northside Generating Station, respectively). The Nassau County site currently has 60 permitted acres and about 3 million yd^3 of space remaining. Because Northside Generating Station would produce about 0.775 million yd^3 per year, the currently available space would be consumed by ash from Northside Generating Station alone in less than 4 years. Although this site's permit expires in 2004, there is an option to purchase an additional 350 acres.

The Trail Ridge site has 148 permitted acres and a remaining capacity for disposal of 19.2 million yd^3 of waste. Ash from Northside Generating Station alone would consume the available capacity at Trail Ridge in 25 years. Similarly, municipal waste from the city of Jacksonville, Florida, currently a high volume customer of Trail Ridge, would also consume the available capacity of this landfill in 25 years. Together, these two sources would exhaust the available capacity in less than 13 years. Therefore, only a portion of Trail Ridge's remaining capacity would be available for ash disposal from Northside Generating Station. A permit would be required for the use of land at Trail Ridge in addition to the 148 acres already in use.

The two southeastern Georgia sites would not be economically attractive because their locations near Valdosta and Jessup are 130 and 100 miles from Northside Generating Station, respectively. Although no individual site appears to be capable of landfilling 25 years of ash from Northside Generating Station, a combination of several sites might be utilized. Additional truck traffic would result from transporting the ash to any of the offsite landfills.

The types of impacts associated with the second scenario (an unsuccessful demonstration followed by limited commercial operation of the CFB combustor facility, supplemented with electricity purchases from other utilities) would be similar to those in the first scenario. However, the level of impacts might be reduced slightly because the facility would not operate as often. On the other hand, Unit 3 might be required to operate at capacity factors greater than historical levels if JEA were unable to purchase sufficient electricity from other utilities. The net effect of these two offsetting factors would depend on the specific changes in levels of operation for the affected units.

Some impacts to resources could result in the vicinity of the utility or utilities providing electricity to JEA, particularly if a new facility were built to meet the JEA demand or if additional fuel were transported to the other site or sites to generate additional electricity. The level of any such impacts would depend on the project-specific characteristics of any facility construction, the fuel required by the facility, and the affected resources in the area.

Impacts associated with the third scenario (an unsuccessful demonstration followed by conversion of the facility to a conventional coal- and petroleum coke-fired power plant using best available control technology) would be similar to those in the first scenario, with the exception that (1) there would be minor impacts associated with dismantling and removing the CFB combustor and related equipment; (2) there would be minor impacts associated with construction and installation of the replacement equipment; (3) there would be a temporary period of time with fewer operational impacts because the CFB combustor would no longer be operating and the conventional facility would not yet be operating; and (4) the wet flue gas desulfurization system of the conventional facility would generate material in the form of bottom ash, fly ash, and wallboard-grade gypsum, all of which could be sold if a sufficient market were available. The amount of material produced would be somewhat less than the quantity of combustion ash under the first scenario because less sorbent would be required by the wet flue gas desulfurization system to remove sulfur. Therefore, the number of trucks transporting the material off

the site would be less under this scenario than the number of trucks transporting combustion ash under the first scenario, unless much more of the first scenario's combustion ash were disposed of on the site or at the adjacent St. Johns River Power Park.